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Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1.   (currently amended) A management server connected to a plurality of servers to manage storage areas included in storage apparatuses as virtual storage areas; wherein

said storage apparatuses are shared by said plurality of servers;

said storage apparatuses include assignment areas which are storage areas assigned to at least one of said plurality of servers;

data stored in said assignment areas of said storage apparatuses includes high-priority data having high priority and low-priority data having low priority;

said management server judges whether data to be written in said storage apparatuses is the high-priority data or the low-priority data on the basis of a write request of data from one of said plurality of servers and keeps a judgment result and position information of storage areas in which said data is written; and

said management server being responsive to an area assignment instruction of storage areas exceeding unassigned areas received from one of said plurality of servers to release at least part of said assignment areas of other servers as unassigned areas and assign released areas to one of said plurality of servers, wherein upon receiving an area assignment instruction, the management server judges whether (i) a size of the unassigned areas exceeds a size of the storage areas specified by said area assignment instruction, (ii) a total size of the unassigned areas and unused areas is at least the size of the storage areas specified by said area assignment instruction, or (iii) a total size of the unassigned areas, the unused areas and storage areas having stored low-priority data is at least the size of the storage areas specified by said area assignment instruction, and when the condition (iii) is met, said management server releases at least part of storage areas in which the low-priority data is stored, of the assignment areas of other servers as unassigned areas and assigns at least areas to one of said plurality of servers;

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wherein when condition (iii) is met and said management server releases storage areas and assignment areas, said management server:

determines a storage area having a largest number of blocks in which low-priority data is stored, the storage area being of the assignment areas of other servers in which low-priority data is stored, wherein the blocks in which low-priority data is stored comprise contiguous blocks, non-contiguous blocks or a combination of non-contiguous and contiguous blocks of low-priority data;

releases as unassigned area the storage area having the largest number of blocks in which low-priority data is stored;

after releasing the storage area, determines whether the total size of the unassigned areas and the unused areas is at least the size of the storage areas specified by said area assignment instruction;

wherein if the total size of the total size of the unassigned areas and the unused areas does not exceed the size of the storage areas specified by said area assignment instruction, said management server iteratively performs the steps of determining a storage area, releasing a storage area, and determining whether the total size of the unassigned, the unused areas and the released storage area is at least the size of the storage areas specified by said area assignment instruction until the total size of the total size of the unassigned areas and the unused areas is at least the size of the storage areas specified by said area assignment instruction or no additional storages areas in which low priority data is stored are available.

2.   (previously presented) A management server according to Claim 1, wherein

said assignment areas of said storage apparatuses include used areas and unused areas; and

said management server includes information for identifying said used areas and said unused areas of said assignment areas;

said management server being responsive to an area assignment instruction of storage areas exceeding the unassigned areas received from one of said plurality of servers to

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release at least part of said unused areas of said assignment areas of other servers on the basis of said identification information as unassigned areas and assign released areas to one of said plurality of servers.

      3.   (canceled).

      4.   (previously presented) A management server according to Claim 2, wherein

      data stored in the used areas in said assignment areas of said storage apparatuses includes high-priority data having high priority and low-priority data having low priority; and

      said management server judges whether data to be written in said storage apparatuses is the high-priority data or the low-priority data on the basis of a write request of data from said server and keeps judgment result and position information of storage areas in which said data is written;

      said management server being responsive to an area assignment instruction of storage areas exceeding the unassigned areas received from one of said plurality of servers to release at least part of unused areas and at least part of areas in which the low-priority data is stored, of the assignment areas of other servers as unassigned areas and assign released areas to one of said plurality of servers.

      5.   (original) A management server according to Claim 1, wherein said management server makes billing processing for each of said plurality of servers utilizing said storage apparatuses at predetermined intervals.

      6.   (previously presented) A management server according to Claim 5, wherein said management server establishes different billing amounts depending on where low-priority data is stored and high-priority data is stored.

      7.   (currently amended) A storage apparatus system comprising:
      a storage apparatuses; and

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a management server connected to a plurality of servers and said storage apparatuses;

said management server managing storage areas of said storage apparatuses as virtual storage areas;

said storage apparatuses being shared by said plurality of servers;

said storage apparatuses including assignment areas which are storage areas assigned to at least one of said plurality of servers;

data stored in said assignment areas of said storage apparatuses includes high-priority data having high priority and low-priority data having low priority;

said management server judges whether data to be written in said storage apparatuses is the high-priority data or the low-priority data on the basis of a write request of data from one of said plurality of servers and keeps judgment result and position information of storage areas in which said data is written;

said management server being responsive to an area assignment instruction of storage areas exceeding unassigned areas received from one of said plurality of servers to release at least part of said assignment areas of other servers as unassigned areas and assign released areas to one of said plurality of servers, wherein upon receiving an area assignment instruction, the management server judges whether (i) a size of the unassigned areas exceeds a size of the storage areas specified by said area assignment instruction, (ii) a total size of the unassigned areas and unused areas is at least the size of the storage areas specified by said area assignment instruction, or (iii) a total size of the unassigned areas, the unused areas and storage areas having stored low-priority data is at least the size of the storage areas specified by said area assignment instruction, and when the condition (iii) is met, said management server releases at least part of storage areas in which the low-priority data is stored, of the assignment areas of other servers as unassigned areas and assigns at least areas to one of said plurality of servers;

wherein when condition (iii) is met and said management server releases storage areas and assignment areas, said management server:

determines a storage area having a largest number of blocks in which low-priority data is stored, the storage area being of the assignment areas of other servers in which

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low-priority data is stored, wherein the blocks in which low-priority data is stored comprise contiguous blocks, non-contiguous blocks or a combination of non-contiguous and contiguous blocks of low-priority data;

releases as unassigned area the storage area having the largest number of blocks in which low-priority data is stored;

after releasing the storage area, determines whether the total size of the unassigned areas and the unused areas is at least the size of the storage areas specified by said area assignment instruction;

wherein if the total size of the total size of the unassigned areas and the unused areas does not exceed the size of the storage areas specified by said area assignment instruction, said management server iteratively performs the steps of determining a storage area, releasing a storage area, and determining whether the total size of the unassigned, the unused areas and the released storage area is at least the size of the storage areas specified by said area assignment instruction until the total size of the total size of the unassigned areas and the unused areas is at least the size of the storage areas specified by said area assignment instruction or no additional storages areas in which low priority data is stored are available.

8.   (previously presented) A storage apparatus system according to Claim 7, wherein

said assignment areas of said storage apparatuses include used areas and unused areas; and

said management server includes information for identifying said used areas and said unused areas of said assignment areas;

said management server being responsive to an area assignment instruction of storage areas exceeding the unassigned areas received from one of said plurality of servers to release at least part of said unused areas of other servers on the basis of said identification information as unassigned areas and assign released areas to one of said plurality of servers.

9.   (canceled).

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10. (previously presented) A storage apparatus system according to Claim 8, wherein

data stored in said used areas of said storage apparatuses includes high-priority data having high priority and low-priority data having low priority; and

said management server judges whether data to be written in said storage apparatuses is the high-priority data or the low-priority data on the basis of a write request of data from one of said plurality of servers and keeps judgment result and position information of storage areas in which said data is written;

said management server being responsive to an area assignment instruction of storage areas exceeding the unassigned areas received from one of said plurality of servers to release at least part of said unused areas and at least part of areas in which the low-priority data is stored, of the assignment areas of other servers as unassigned areas and assign released areas to one of said plurality of servers.

11. (original) A storage apparatus system according to Claim 7, wherein said management server makes billing processing for each of said plurality of servers utilizing said storage apparatuses at predetermined intervals.

12. (previously presented) A storage apparatus system according to Claim 11, wherein said management server establishes different billing amounts depending on where low-priority data is stored and high-priority data is stored.

13. (currently amended) A computer program product for a management server which manages storage areas included in storage apparatuses as virtual storage areas, wherein

said management server is connected to a plurality of servers; and

said storage apparatuses are shared by said plurality of servers through said management server and include assignment areas which are storage areas assigned to at least one of said plurality of servers, wherein data stored in said assignment areas of said storage

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apparatuses include high-priority data having high priority and low-priority data having low priority;

said computer program product comprising:

a code for judging on the basis of a write request of data from one of said plurality of servers whether data to be written in said storage apparatuses is said high-priority data or said low-priority data; and

a code for information indicative of judgment result and position of storage areas in which said data is written; and

a code for being responsive to an area assignment instruction of storage areas exceeding unassigned areas received from one of said plurality of servers to release at least part of assignment areas of other servers as unassigned areas and assign released area to one of said plurality of servers, wherein upon receiving an area assignment instruction, the code for being responsive to an area assignment instruction judges whether (i) a size of the unassigned areas exceeds a size of the storage areas specified by said area assignment instruction, (ii) a total size of the unassigned areas and unused areas is at least the size of the storage areas specified by said area assignment instruction, or (iii) a total size of the unassigned areas, the unused areas and storage areas having stored low-priority data is at least the size of the storage areas specified by said area assignment instruction, and when the condition (iii) is met, said management server releases at least part of storage areas in which the low-priority data is stored, of the assignment areas of other servers as unassigned areas and assigns at least areas to one of said plurality of servers;

a code executed when condition (iii) is met, the code including:

a code for determining a storage area having a largest number of blocks in which low-priority data is stored, the storage area being of the assignment areas of other servers in which low-priority data is stored, wherein the blocks in which low-priority data is stored comprise contiguous blocks, non-contiguous blocks or a combination of non-contiguous and contiguous blocks of low-priority data;

a code for releasing as unassigned area the storage area having the largest number of blocks in which low-priority data is stored;

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a code for determining whether the total size of the unassigned areas and the unused areas is at least the size of the storage areas specified by said area assignment instruction after releasing as unassigned area the storage area having the largest number of blocks in which low priority data was stored;

wherein if the total size of the total size of the unassigned areas and the unused areas does not exceed the size of the storage areas specified by said area assignment instruction, said management server iteratively performs the steps of determining a storage area, releasing a storage area, and determining whether the total size of the unassigned, the unused areas and the released storage area is at least the size of the storage areas specified by said area assignment instruction until the total size of the total size of the unassigned areas and the unused areas is at least the size of the storage areas specified by said area assignment instruction or no additional storages areas in which low priority data is stored are available; and

a computer readable storage medium for storing said code.

14.   (previously presented) A computer program product according to Claim 13, wherein said assignment areas of said storage apparatuses include used areas and unused areas; and said computer program product further comprising:

a code for information for identifying said used areas and said unused areas of said assignment areas;

said code for releasing at least part of assignment areas of other servers as unassigned areas including a code for being responsive to the area assignment instruction of storage areas exceeding unassigned areas received from one of said plurality of servers to release at least part of said unused areas of other servers as unassigned areas on the basis of said identification information.

15.   (canceled).

16.   (previously presented) A computer program product according to Claim 14, wherein data stored in said used areas of said storage apparatuses include high-priority

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data having high priority and low-priority data having low priority; and said computer program product further comprising:

a code for judging on the basis of a write request of data from one of said plurality of servers whether data to be written in said storage apparatuses is said high-priority data or said low-priority data; and

a code for information indicative of judgment result and position of storage areas in which said data is written;

said code for releasing at least part of unused areas of assignment areas of other servers as unassigned areas including a code for being responsive to the area assignment instruction of storage areas exceeding the unassigned areas received from one of said plurality of servers to release at least part of said unused areas and at least part of areas in which said low-priority data is stored, of the assignment areas of other servers as unassigned areas.

17.   (previously presented) A computer program product according to Claim 13, further comprising:

a code for causing said management server to execute billing processing for each of said plurality of servers utilizing said storage apparatuses at predetermined intervals.

18.   (previously presented) A computer program product according to Claim 17, further comprising:

a code for establishing different billing amounts depending on the cases where low-priority data is stored and high-priority data is stored.

19.   (previously presented) A management server according to claim 1, further comprising a storage pool management program, wherein said storage pool management program has at least an unassigned block list and information on a number of unassigned blocks and, when at least said number of unassigned blocks exceeds a size of area assignment requested by said area assignment instruction received from said one of said plurality of servers, determines that the requested area assignment is possible and executes area assignment processing including separating unassigned area of said size from the unassigned block list.

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20.   (previously presented) A management server according to claim 19, wherein said storage pool management program further comprises storage pool assignment information, said storage pool assignment information including information on a number of unused blocks for each virtual storage area and a server from the plurality of servers to which the virtual storage area is assigned, wherein when a total number of said number of unassigned blocks and said number of unused blocks exceeds said size of area assignment requested by said area assignment instruction received from said one of said plurality of servers, said storage pool management program determines that the requested area assignment is possible and executes area return processing including issuing an area return instruction to a server to which a virtual storage area having said number of unused blocks has been assigned.

21.   (canceled).

22.   (currently amended) A management server according to claim 1, wherein in response to an area release instruction, said management server:

updates an unassigned block list to include blocks of a storage area identified by the area release instruction;

determines a number of used blocks in the storage area identified by the area release instruction[[s]], a number of assigned blocks in the storage area, and a number of high-priority blocks in the storage area;

decrements a total number of used blocks by the number of used blocks in the storage area to be released;

decrements a total number of assigned blocks by the number of assigned blocks in the storage area to be released;

decrements a total number of high-priority blocks by the number of high-priority blocks in the storage area to be released;

updates an assignment state bit map, a use state bit map and a data priority bit map, wherein the assignment state bit map, the use state bit map and the data priority bit map comprise a set of bits representing blocks of data in a storage pool, and wherein the assignment state bit map ~~represents~~ indicates whether each ~~assigned blocks~~ block of data in the storage pool

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is assigned, the use state bit map indicates whether each block used blocks of data in the storage

pool is used, and the data priority bit map indicates whether each block of data in the storage

pool is high or low priority assigned state bit map represents assigned blocks of data in the

storage pool.

      23.   (canceled).

      24.   (currently amended) A storage apparatus system according to claim 7,

wherein in response to an area release instruction, said management server:

      updates an unassigned block list to include blocks of a storage area identified by

the area release instruction;

      determines a number of used blocks in the storage area identified by the area

release instruction[[s]], a number of assigned blocks in the storage area, and a number of high-

priority blocks in the storage area;

      decrements a total number of used blocks by the number of used blocks in the

storage area to be released;

      decrements a total number of assigned blocks by the number of assigned blocks in

the storage area to be released;

      decrements a total number of high-priority blocks by the number of high-priority

blocks in the storage area to be released;

      updates an assignment state bit map, a use state bit map and a data priority bit

map, wherein the assignment state bit map, the use state bit map and the data priority bit map

comprise a set of bits representing blocks of data in a storage pool, and wherein the assignment

state bit map represents indicates whether each assigned blocks block of data in the storage pool

is assigned, the use state bit map indicates whether each block used blocks of data in the storage

pool is used, and the data priority bit map indicates whether each block of data in the storage

pool is high or low priority assigned state bit map represents assigned blocks of data in the

storage pool.

      25.   (canceled).

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26.   (currently amended) A computer program product to claim 13, wherein in response to an area release instruction, said management server:

updates an unassigned block list to include blocks of a storage area identified by the area release instruction;

determines a number of used blocks in the storage area identified by the area release instruction[[s]], a number of assigned blocks in the storage area, and a number of high-priority blocks in the storage area;

decrements a total number of used blocks by the number of used blocks in the storage area to be released;

decrements a total number of assigned blocks by the number of assigned blocks in the storage area to be released;

decrements a total number of high-priority blocks by the number of high-priority blocks in the storage area to be released;

updates an assignment state bit map, a use state bit map and a data priority bit map, wherein the assignment state bit map, the use state bit map and the data priority bit map comprise a set of bits representing blocks of data in a storage pool, and wherein the assignment state bit map represents indicates whether each assigned blocks block of data in the storage pool is assigned, the use state bit map indicates whether each block used blocks of data in the storage pool is used, and the data priority bit map indicates whether each block of data in the storage pool is high or low priority assigned state bit map represents assigned blocks of data in the storage pool.